

of the North of England, is engaged in founding at Newcastle-upon-Tyne.

The Executive Committee fully recognises the importance of Biology. The professorial chair, which was called at the public meeting that of Geology and Mineralogy, will be called, according to a subsequent decision of the committee, the Chair of Geology, Biology, and Mineralogy. It is true that this designation leaves it uncertain whether Biology is co-ordinated with Geology, and has its claim to be a distinct science allowed, or is subordinated and intended to be treated only as a component part of Geology. In the former case, it may be said, the Chair will be too capacious for one man to fill; in the latter, the rights of biology are but inadequately acknowledged.

The answer to this is, that the programme of teaching is necessarily, at the present stage of affairs, initiatory. It will, no doubt, when the work of the Institution has commenced, and the scale of operations which everything seems to foreshadow has been in some measure realised, receive such expansions and modifications as are suitable to the relative value of the sciences, and the actual wants of the students.

J. WAITE

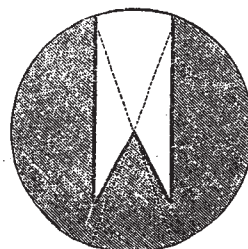
University College, Durham, April 17

The Aurora Borealis

A VERY bright display of aurora was visible here last night, illuminating the greater part of the heavens at intervals with a fitful light. At 9h. 45m., when I first noticed it, broad cirrus-like brushes of white light stretched in parallel bands across the zenith, from below Corona in the north-east, across Cor Caroli, nearly overhead, to about the altitude, and 15° or 20° south of Venus, then shining dimly through clouds in the western sky. My view of the aurora was afterwards confined to an east window; but from a short examination of a clear part of the sky towards south-west, it appeared to be almost as bright, at first, in the opposite direction as in the quarter between north and east, where I had, from that time onwards, an uninterrupted view of its progress. The streamers were white, and irregular in form, rising from no distinct arch, or definite base in any quarter, but they occasionally met and formed a bright corona overhead. A rose-tint pervaded some of them, in the north-east, at 10h. 30m., and presented itself in different parts of the sky until about 11h., when the phenomenon faded, and a faint glow only remained visible in the north. At about 11h. 40m., while streamers reappeared, forming a bright corona overhead, whose arcs and beams appeared to grow more densely luminous until 12h. 15m. It then showed a well-defined central nucleus, with rays of great brightness proceeding from it, about three-sevenths of the distance from η Ursæ Majoris to Arcturus, white streamers rising to meet it all round, with the appearance of a cupola or dome. While I watched some of the brighter stars through its dense light-cloud, it rapidly assumed a vivid fiery red colour, and a similar bright appearance breaking out at the same moment at the base of a north-east streamer, the fiery glow reflected among the clouds in that direction perfectly resembled a distant conflagration. A wide expanse of brilliant orange and crimson-red light soon joined these two regions of greatest intensity together in one splendid blaze of ruddy colours. This brilliant outburst faded away at 12h. 25m., the streamers disappearing, until 12h. 40m., when they again met overhead, and formed a corona with a sharply-defined nucleus, about 3° west of the star γ Bootis. The light of the white streamers flickered considerably, as if waves of varying brightness were driven rapidly over the whole phenomenon by the wind. Until after two o'clock, when the moon rose, and their light was weakened although not extinguished, a constant succession of bright streamers occupied the north-east sky between the horizon and the zenith; towards these I directed the slit of a Browning's Student's Spectroscope, in order to determine, if possible, the position of some of the auroral lines. A single greenish line only was so faintly visible in the spectroscope that all attempts to view it simultaneously with the cross-wires of the instrument proved unsuccessful. A simple form of pointer, substituted for the use of the wires in the dark field of the telescope enabled me, however, to identify its position with considerable accuracy.

A circular card, of the figure shown in the sketch, was slipped into the forward end of the eye-piece until it reached the diaphragm upon which the cross wires are stretched. It was so disposed that the angular pointer in the middle of the card exactly filled up the lower angle of the cross-wires; and its sharp

point coincides almost exactly with the place of their intersection. In a field of view almost dark it was possible to see the summit of the card-pointer with considerable distinctness; and if a great and imposing phenomenon may be compared with an object so diminutive, the appearance of its dark peak, surmounted by the narrow, flickering line of light, resembled in the dim field of view the cone of a volcano, projecting in a thin



jet from its apex frequent eruptions of varying height and brightness. By obtaining a reading of the soda-line seen in the flame of a salted spirit lamp, and referred to the pointer in the same manner, I obtained as a result of three observations of the auroral line, differing less than two minutes on the graduated position-circle of the spectroscope, a place in the spectrum twenty-four minutes more refrangible than Fraunhofer's line D. Many observations of the dark lines of the solar spectrum, compared with their positions in Kirchhoff's maps, having assured me that a minute of arc on this spectroscope corresponds between Fraunhofer's lines D and δ , with 10.44 divisions of Kirchhoff's scale, the resulting difference of refrangibility between the green auroral line and Fraunhofer's line D is 250.6 divisions of Kirchhoff's scale; and its absolute position, assuming for that of D to be 1005 Kirchhoff, was within 10 or 20 units on either side of a place at about Kirchhoff 1255. A bright line in the spectrum of the aurora was observed by M. O. Struve at Pulkowa, in April 1868, whose position he ascertained to be within 10 or 15 units of the scale at Kirchhoff 1259, a place apparently identical with that of the bright line which was principally visible in last night's aurora. The faint and uncertain brightness of its appearance, while confining my attention principally to its observation, prevented me from searching in other parts of the spectrum for accompanying bright lines. Within a space of about 400 Kirchhoff on each side of that which was recorded, I could, however, perceive no traces of any co-existing lines. The position of the bright lines which are most conspicuous in different auroras is, perhaps, a subject of interesting inquiry in connection with the yet unascertained laws which govern their appearance, and with the varying characters and peculiarities of their phases. A remarkable circumstance connected with the appearance of the single line observed on this occasion, was the flickering and frequent changes with which it rose and fell in brightness, apparently even more rapidly than the swiftly travelling waves, or pulsations of light, that repeatedly passed over the streamers, near the northern horizon, towards which the spectroscope was directed.

A. S. HERSCHEL

Andersonian University, Glasgow, April 10

THERE was a brilliant display of aurora borealis visible from this place on Sunday the 9th inst. I first noticed it about 10.45 P.M.; there was then a considerable luminosity in the N.W. with a magnificent red glow and streamers springing from the W. extending to within 20° of the eastern horizon, also radiation from other parts in the N. and N.W., but less brilliant. At about 10.55 P.M., a bright streamer made its appearance near the zenith crossing the red at right angles, and standing out clearly upon it. The aurora had nearly faded away at 11.10. When it was at its brightest through a direct-vision spectroscope with the slit rather wide and directed to the N.W., where there was scarcely any colour, the red and green bands usually seen under such circumstances were clearly defined, more particularly the red band. I then directed the spectroscope to the W., at a part where the red light was most intense, to my surprise the red band was scarcely to be discerned, and looked blurred, and spread out

towards the green, which was better defined, but not clearly so. I several times repeated the observation with the same result. This, if confirmed by other observations, would appear to point to some fluorescent property of the upper atmosphere.

W. J. B. THOMPSON

Weybridge Heath, Surrey, April 11

THERE was a magnificent auroral display last night (Sunday), which commenced at 10.45 P.M., and continued till 11.15. The streamers radiated from a point due N.W., there being no clouds in their vicinity, the colour was a deep red, and they extended far beyond the zenith. At 11.20 another display was seen, but at right angles to the previous one, and streamed across the zenith due N. and S. When the sun had set there was an accumulation of stratified clouds near the western horizon and quite horizontal, these gradually rose radially, having their centre situated a little north of that of the aurora; and at about 11.10 the uppermost radii passed into the field of the northernmost streamers, so that it became impossible for me to distinguish between them which was cloud and which was auroral. After the first appearance had faded away, the second was seen to proceed from these clouds upon the latter passing overhead, but did not last longer than fifteen minutes, by which time the radial clouds had become so dissipated as to lose their character, and, to me, were almost invisible. I may mention that this peculiarity in the clouds was noticed on Saturday evening (the 8th inst.) after sunset.

The old superstition of bloodshed taking place in a distant country, and the red colour being the sign, is still prevalent; it was asked of me, by an observer, "whether there was a war in Paris, or was it on fire, as the reflection of something like it was in the sky?" Another declared he could hear "distant noises of the clashing of weapons." * But the assertion of an old woman who was amongst my interrogators, was that it was the reflection of fire, and "showed that *mahogany* was burning." The ignorance on this subject is appalling, and when we have such absurd accounts of the aurora borealis from persons of our own time, surely the obscure mentions of this phenomenon in the old chronicles (*vide* my article on this subject in NATURE for Dec. 29, 1870) by perhaps equally ignorant observers of nature, are not so difficult of interpretation as many imagine. The experience of the present is the key to the past.

JOHN JEREMIAH

43, Red Lion Street, Clerkenwell, April 10

ON Saturday, the 15th inst., a remarkably fine aurora was to be seen here towards the N.N.W. It was first observed at 8.45, and continued from then shining brightly till 9 P.M., when it made its disappearance. At first it formed a complete rose-coloured arch, in which flickering rays of bright white light were occasionally to be seen. During its appearance its position was gradually shifted round to the north, where it remained till it disappeared.

J. B. F.

Marlborough College, April 17

The Comparative Aggregate Strength of the Light from the Red Hydrogen-Stratum, and of that from the rest of the Chromosphere

I WAS a spectator of the total eclipse on December 22, and though I had no further connection with the Government expedition than that I was favoured with a passage home in H.M.S. *Urgent*, I was kindly permitted by the Rev. Mr. Perry and his party to set up my telescope at their observatory at San Antonio, near Port St. Mary, on the harbour of Cadiz.

I made an observation during the total phase, which I ought to have published sooner, but did not, partly from the distrust which an inexperienced observer naturally feels in his own results, and partly because I did not see that it might have some value. As I now think it may be of some interest, I will state what I saw.

* How old and persistent this belief is may be shown by quoting a remarkable passage from Pliny. In Book II. chap. lvi., he says—"In the time of the Cimbrian Wars we have been told that armour was heard to rustle and the trumpet to sound out of heaven, and this happened very often both before and after those wars. But in the third consulship of Marius the Amerines and Tudertes saw men in arms in the sky, rushing one against another, from the east and west, and those from the west were discomfited. That the very firmament itself should be on fire is no wonder, for often it hath been seen when clouds have caught any great deal of fire." This same appearance is very probably that which Josephus refers to in his narrative of the terrors sent by God previous to the siege of Jerusalem.

The instrument which I used was one of Browning's direct-vision spectroscopes with seven prisms. It was not fitted to the telescope which I had with me, simply because I had not time to get them properly adapted to one another either before leaving England, or after arriving at Gibraltar by the Peninsular and Oriental steamer on December 16.

I spent the first thirty or forty seconds of totality in taking a general observation with the telescope; after that I gave it up to the friend who was travelling with me, and had fifty seconds at least during which I used the spectroscope. At first I tried to use it with the slit moderately narrow (about '005in.); but, as there was much cloud over the moon, though not enough to prevent the corona and a slight amount of red light from the red hydrogen-stratum being seen with the naked eye, I could get no light to pass through the prisms while the slit was narrow; accordingly, I enlarged the slit to a width which would be absurd under most circumstances (about '025in.), and then, taking a general view of the corona, saw a spectrum in which the red and green were present, but the blue and violet totally absent, and on this spectrum one line and one only; this line was strong compared with the rest of the spectrum, red, and of course broad to correspond with the width of the slit; and from its position on the continuous red part of the spectrum was either C or near it.

After I first saw this spectrum and line I had fully thirty seconds, which I employed in directing the slit as well as I could towards all parts of the corona, and in seeking for other lines; during the whole of the time I saw the same spectrum and the same red line only.

As this spectrum and line, from the nature of my instrument, must have proceeded from the mingled light of all parts of the chromosphere, I consider my observation as a humble imitation of that made by Mr. Pye, recorded in Prof. Young's article in NATURE for February 2 (p. 261). The mingled light was sufficient to give him with his delicate instrument the lines C, D, 1474; and he estimated the light of 1474 to be apparently greater than that of C, and to bear to it the ratio of 10 to 8.5; yet the light of 1474 was not sufficient to penetrate my rougher instrument, although the red line (which I can hardly doubt was C) showed conspicuously throughout the time that I turned the spectroscope upon the corona.

Whatever value my observation has it must be set in the balance against Mr. Pye's, and tends to weaken the argument by which Prof. Young attempts (in the article above-quoted) to show that the angular area of the self-luminous corona bears to that of the red hydrogen-stratum visible during totality so large a ratio as 35 or 70 to 1, and consequently extends 8' or 16' from the sun; in fact my observation tends to give a smaller extent of self-luminous corona than Mr. Pye's.

BASIL E. HAMMOND

53, Bilton Road, Rugby, April 11

Mount Washington

TWICE recently it has been mentioned in your columns that Mount Washington in New England attains the height of 10,000 ft. If it were so its summit, for nearly 2,000 ft., would be clothed with perpetual snow. The most careful measurements—those of Prof. Guyot—give the height of the mountain as 6,288 ft.

SAMUEL H. SCUDDER

Mentone, April 13

[The communications in question were received from an American correspondent.—ED.]

The Name "Britain"

THE existence in former times of other Britains than those of our own island should not be overlooked in discussing the derivation of the word. According to Dr. Karl von Spruner's maps of France and Spain for the sixth century, besides the Britannia in the north-west of France, there was a town called Britonia (the present Mondonedo) in the north-west of Spain. Unless the similarity of these names is nothing more than a strange coincidence, it does not seem probable that the name Britannia can have any connection with the tin which is found only in one of the Britannias. Carte (vol. i. p. 10, note), speaking of the Phrygians (Briges) "the first nation that entered Europe," says, "of this sort are the people known over England, Scotland, and Ireland, by the name of Brigantes; the Brianni on the sea coast of Gallia Belgica; the Brigani mentioned by Pliny as seated in the Alpes A Brigantium, now Braganza in Portugal; and another (town) of the same name, now Britançã